



Office of Technical Assistance
www.state.ma.us/ota

Fact Sheet

Reporting Mercury and Mercury Compounds

Lower TRI and TURA Reporting Threshold for Mercury and Mercury Compounds:

On October 29, 1999, the Environmental Protection Agency (EPA), under the Emergency Planning and Community Right-to-Know Act (EPCRA) Section 313, modified the reporting requirements for both mercury and the mercury compounds category and lowered the Toxics Release Inventory (TRI) reporting threshold. The Massachusetts Toxics Use Reduction Act, M.G.L. c. 21I (TURA), adopted these modified reporting requirements. The reporting threshold for both mercury and mercury compounds is 10 pounds per calendar year.

Classification of Mercury and Mercury Compounds:

The EPA classified mercury and mercury compounds as Persistent, Bioaccumulative, and Toxic (PBT) chemicals. PBT chemicals are a concern because they are highly toxic, do not break down easily in the environment, and accumulate in living tissues. The reduced thresholds of this category for federal and state chemical reporting requirements is part of a nationwide initiative to reduce the risks to human health and the environment from exposure to PBT pollutants. Elemental mercury is found in:

- Metal ores
- Thermometers
- Dental amalgam
- Batteries
- Electrical switches
- Thermal-sensing devices
- Fluorescent lamps
- Thermostats

Elemental mercury and mercury compounds are present in trace quantities in various fuels and their combustion emissions, such as coal, oil, and wood. Other industry and process sources of mercury and mercury compounds are listed in Table 1.

*Contact the Massachusetts Department of
Environmental Protection to request a TURA
Form S reporting package at 617-292-5982 or
www.state.ma.us/dep/wpd/hm/tura/turapub.htm*

Who Must File TURA Form S for Mercury or Mercury Compounds?

Under the reporting requirements, a facility must file a Form S for mercury and mercury compounds if it meets ALL THREE of the following criteria:

1. Has one of the following SIC codes: 10-14, 20-40, 44-51, 72, 73, 75, or 76; AND
2. Has 10 or more full-time employees or the equivalent of 20,000 hours per year; AND
3. Manufactures (including imports), processes or otherwise uses 10 pounds per year or more of mercury and mercury compounds.

Reporting Mercury and Mercury Compounds:

The amount of mercury and mercury compounds that is manufactured, including coincidentally manufactured, processed or otherwise used must be accounted for in determining if a facility meets the reporting threshold.

Separate thresholds must be determined for both elemental mercury (by using the weight of the metal) and for mercury compounds (by using the weight of the entire compound). However, if the threshold for both is exceeded, only one TRI Form R and TURA Form S is necessary and the reportable amount is the sum of both mercury and mercury compounds.

For examples of threshold determinations refer to the EPA "EPCRA – Section 313: Guidance for Reporting Toxic Chemicals: Mercury and Mercury Compounds Category" document, available at: <http://www.epa.gov/tri/guidance.htm>

Quantifying Mercury and Mercury Compounds:

The quantity of mercury and mercury compounds must be determined for each activity – manufacture, process, or otherwise use. It is recommended that a facility subject to reporting under TRI and TURA use the best readily available data applicable to their operations. The following methods are listed from most accurate to least accurate.

1. Use facility-specific monitoring data.
2. Use facility-specific emission factors.
3. Use EPA default emission factors provided in the EPA guidance document.

Table 1. Industries and process sources of mercury or mercury compounds.

Industry/Process & SIC	Sources of Mercury	Mercury or Mercury Compounds
Chlor-alkali production – mercury cell process: 2812	By-product hydrogen stream, end box and cell room ventilation	Mercury
Pulp & Paper production: 2611, 2621, 2631	Chemical recovery	Mercury
Portland cement production: 3241	Fuel combustion, in raw material	Mercury
Lime manufacturing: 3247	Combustion	Mercury
Plastic materials & resin manufacturing: 308-	Formulation component	Mercury compounds
Steel industry – coke production: 2999	Coal preparation and handling, fugitive emissions from oven	Mercury compounds
Primary copper smelting: 3366	Roasting, smelting furnace	Mercury
Primary lead smelting: 336-	Sintering, blast furnace	Mercury
Copper foil production: 3497	Drum room, treating room	Mercury compounds
Thermometer manufacture: 3823, 3829	Mercury purification and transfer, filling, heating-out process	Mercury
Hot mix asphalt batch plants: 2951	Rotary dryer	Mercury compounds
Crematories: 7261	Combustion	Mercury
Various biocidal coatings	Constituent	Mercury compounds
Sulfuric acids obtained from smelting operations	Impurity	Mercury

When determining the content of mercury or mercury compounds in fossil fuels, assume mercurous oxide (Hg_2O) as the mercury compound constituent and if combusted on site assume that elemental mercury is coincidentally manufactured. The EPA's average default values for mercury content in common fuels, with applicable emissions factors, is shown in Table 2. The content values in fuel oils should be adjusted by the weight ratio of mercurous oxide (Hg_2O) to elemental mercury, a factor of 1.08. In the case of coals, mercury is expected to appear in metal compounds.

When determining the amount of mercury or mercury compounds present in a material and the form of mercury is unknown, assume elemental mercury. Mercury is also a potential contaminant in sulfuric acid, which is widely used in industry. Content levels of mercury in the acid can vary greatly from batch to batch; therefore facilities should contact their suppliers for specific values. Table 3 shows the EPA content/emissions factors for several other processes that involve mercury in small amounts.

Products or devices that contain mercury may qualify under the article exemption and therefore would not be reported under TRI and TURA. For example, mercury in a thermometer or thermostat would not be counted toward threshold amounts since those devices would be articles.

All releases and waste management quantities greater than 0.1 pound of mercury must be reported under TRI (Form R) if other activities at the facility would cause threshold values (10 pounds) to be exceeded for mercury or mercury compounds.

Typical amounts of mercury contained in common devices are:

- Fluorescent lights: 8-90 mg (avg 4' lamp is 20-50 mg)
- Thermostats: 3,000-6,000 mg
- Silent switches: 2,600 mg (light switches prior to 1991)
- Accustat: approximately 1,000 mg

If you are not sure of the mercury content of a device, contact the supplier or manufacturer to obtain that information.

Modification of Reporting Procedures:

Reporting procedures for PBTs have been modified and apply to both mercury and the mercury compounds category.

De minimis Exemption Eliminated: The amount of all mercury and mercury compounds, regardless of how minimal the concentration, must be reported.

Range Codes Prohibited: An actual amount must be reported for mercury and mercury compounds. Using range codes is not an option for this category.

Data Precision: Mercury and mercury compounds must be reported precisely, based on the accuracy of supporting data. The minimum reportable amount is 0.1 pounds. If the amount is less than 0.05 pounds, "0" should be recorded rather than "N/A" (not applicable).

Exclusion from Form A: The use of Form A for reporting mercury and mercury compounds is prohibited. Form R must be used.

Table 2. EPA estimated average mercury content for common fuels.

Fuel Type Combusted	Average Mercury Content	Average Mercury Emissions Factor
No.2 Fuel Oil – uncontrolled	0.001 ppm	4.23×10^{-4} lbs/1000 gal oil
No.6 Fuel Oil – uncontrolled	0.00067 ppm	1.13×10^{-4} lbs/1000 gal oil
Bituminous coal – using PC boiler with CS-ESP controls	0.11 ppm	1.18×10^{-4} lbs/ton coal
Wet wood – using PM controls	Use emissions factor ²	5.15×10^{-6} lbs/ton wood
Municipal solid waste – using acid gas controls	Use emissions factor ²	0.0017 lbs/ton waste
Medical waste – using wet scrubber controls	Use emissions factor ²	0.0026 lbs/ton waste

² For the purpose of threshold determinations, emissions factor can be used in the absence of content data.

Nuances in Filing Form S:

The thresholds for PBT classified chemicals are the same for state and federal regulations; therefore many Massachusetts companies are required to file both TRI Form R and TURA Form S. Though the reporting procedures for both forms are similar, there are some differences in filing Form S. These are:

- Massachusetts TURA regulations have a broader SIC coverage than the federal EPCRA regulations.
- A facility filing a Form S must report chemical use as well as waste/byproduct generation.

OTA Assistance Services

The Office of Technical Assistance (OTA) provides one-on-one technical assistance on pollution prevention (P2), toxics use reduction (TUR) and compliance – as well as guidance in the form of workshops, case studies, manuals and other materials. OTA helps toxics users in Massachusetts to identify TUR/P2 opportunities within their operations and initiate planning efforts. Contact OTA at:

*251 Causeway Street, Suite 900, Boston, MA 02114
Phone: (617) 626-1060 or on-line at
www.state.ma.us/ota*

Example:

A Massachusetts facility has an SIC code covered by both TURA and TRI. It has more than 10 full-time employees and combusts 100,000 tons of bituminous coal annually in a PC boiler with a cold-side electrostatic precipitator (CS-ESP). Using the emission factor from the EPA mercury guidance document, the amount of mercury and mercury compounds produced is:

$(100,000 \text{ tons}) \times (2000 \text{ lbs/ton}) \times (0.11 \text{ lbs Hg}/1 \times 10^6 \text{ lbs coal}) \times (1.08 \text{ oxide factor}) = 23.76 \text{ lbs Hg}_2\text{O}$ otherwise used.

$(100,000 \text{ tons}) \times (1.18 \times 10^{-4} \text{ lbs Hg}/1 \text{ lb coal combusted}) = 11.8 \text{ lbs elemental mercury}$ coincidentally manufactured.

The facility exceeded the reporting thresholds for the mercury and mercury compounds category. Therefore only one Form R and Form S must be submitted. The reported amount is the sum of the elemental mercury and mercury compounds.

Table 3. EPA estimated average mercury content/emissions factor for other industrial processes.

Process Type	Mercury Content/Emissions Factor
Chlor-alkali mercury cell process, hydrogen vent (uncontrolled)	3.3×10^{-3} lbs/ton Chlorine produced
Lead smelting operations	0.0004 lbs/ton ore concentrate
Raw mix cement	0.01 ppm
Glass manufacture	0.0001 lbs/ton silica used
Carbon black manufacture or processing	0.0003 lbs/ton carbon black
Cremation of remains	0.0097 lbs/average-weighted person
Electrical switch manufacture	8 lbs/ton mercury used
Primary copper smelting	7.8×10^{-5} lbs/ton metal